**3GPP TSG-RAN WG2 Meeting #116bis-eR2-220xxxx**

**E-meeting, 17th – 25th January 2022**

**Title: [DRAFT] Reply LS on IoT NTN extended NAS supervision timers at satellite access**

**Release: Rel-17**

**Work Item: LTE\_NBIOT\_eMTC\_NTN, 5GSAT\_ARCH-CT**

**Source: Ericsson**

**To: CT1**

**Cc: SA2**

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**Send any reply LS to: 3GPP Liaisons Coordinator,** [**mailto:3GPPLiaison@etsi.org**](mailto:3GPPLiaison@etsi.org)

# 1 Overall description

RAN2 received an LS from CT1 asking about feasibility of the current NAS supervision timer in C1-215074:

*As the NAS supervision timers control triggering of NAS message re-transmission and determination of NAS procedure failure, updated timing for NAS message transport in AS compared to current NG-RAN needs to be considered. Therefore, CT1 would appreciate answers to the following questions:*

* *For all satellite access types (LEO, MEO, GEO) where AS timing is updated, what is the worst-case delay in AS for transport of NAS messages via satellite access, including potential delays due to GNSS fix acquisition:*
  + 1. *For initial NAS messages in the UL direction;*
    2. *For non-initial NAS messages in the UL direction; and*
    3. *For NAS messages in the DL direction.*

This was replied to by NR NTN in R2-2111612, where the values for the physical RTT is for LEO and GEO are also applicable for IoT NTN.

IoT NTN RAN2 has evaluated the possible latencies in the 3 above cases with varying results depending on configuration and notes that it is difficult to converge on a set of numbers that balances worst case scenarios and reasonable configurations. The difference between NR and IoT is that the maximum transmission durations in the most extreme cases for a single PUSCH transmission can be more than 2 seconds and 40 seconds for LTE-M and NB-IoT respectively. While the NTN physical propagation delays are longer than in terrestrial networks, RAN2 notes that for GEO scenario the physical propagation delays only constitute roughly 10% and 1% of the total transmission delay for eMTC and NB-IoT respectively for the most extreme transmission durations.

Given this, RAN2 observes the following:

* If the timers for terrestrial IoT are considered sufficient, then it is likely that the timers are sufficient for IoT NTN (eMTC and NB-IoT).

Furthermore, similar to NR NTN the requirement is that UE shall have a valid GNSS position for synchronization to an NTN cell. This means that the UE might need to perform GNSS acquisition before initial access. In the absolute worst case, the acquisition of a GNSS fix can in a cold state take up to 100 s, from a warm state – 50 s and from hot state – 2 s.

# 2 Actions

**To RAN2**

**ACTION:** RAN2 asks CT1 to take the above aspects in to account in their work.

# 3 Dates of next TSG RAN WG2 meetings

RAN2#117-e 21st February - 3rd March 2021 electronic meeting

RAN2#118-e 16th May – 27th May electronic meeting